M/037/023

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9-10-03 3 pages total

Paul

This is the WRITE up ~~that will accompany~~ WITHOUT THE photographs. The write up AND PHOTOGRAPHS will accompany the release Request.

I am back FROM THE meeting so if you have any comments please CALL

Thanks

Tony

EFFECTIVE RECLAMATION TECHNIQUES

Calliham Mine

Utah Division of Oil, Gas and Mining Permit M/037/023
San Juan County, Utah

Umetco Minerals Corporation
Grand Junction, Colorado

The Calliham Mine is a large underground uranium/vanadium mine in southeast Utah that operated from 1973 to 1991. Atlas Minerals Corporation obtained the original mine permit in 1977 and Umetco acquired the permit in 1988. The ore bodies were accessed by rubber tired equipment through a decline. Operations began before reclamation laws were enacted, and mine spoils were placed with little thought of future environmental considerations (Figures 1 and 3). Topsoil was not salvaged prior to mining, and mine spoils were placed in drainages. In 2000, using unique techniques to borrow topsoil onsite, Umetco successfully reclaimed the entire site to range land (Figures 2 and 4).

PRE RECLAMATION SITE CONDITIONS

Figure 5 is an aerial view of the site before reclamation. Mine spoils were deposited southeast of the portal. The spoils approached drainages on both the east (auxiliary drainage) and south (main drainage) sides of the mine spoils pile, and an access road was constructed of mine spoils in the main drainage. The mine spoils pile also completely blocked a small basin (north basin). Two large low-grade ore piles (A and B) and an ore pad to the southwest of the mine spoils pile were also developed (Figures 3 and 6). No topsoil was salvaged during the creation or operation of any of the spoils piles.

MINE RECLAMATION

Objectives

Umetco operates under Union Carbide Corporation Responsible Care® standards, directing company employees to conduct projects in a manner that protects the environment along with the health and safety of employees and the public. The Calliham reclamation project was a challenge for Umetco. How could the site be effectively reclaimed with the obstacles presented by the site conditions? Prior to reclamation the following decisions were made:

- Where feasible, remove mine spoils from drainage pathways.
- Stabilize the slopes of the mine spoils and low-grade piles sufficiently to protect the drainage pathways and surrounding area.
- If possible, obtain available topsoil to cover the mine spoils and low grade piles to assist in the long-term stabilization of the site without disturbing new ground.

Drainage Areas

As an enhancement to the state reclamation plan, Umetco moved the toe of the mine spoils pile at least 20 feet from drainage pathways. Mine spoils in the existing access road were removed and placed on the spoils pile. A new access road was constructed outside of the drainage area. The small area of the north basin was predominantly bedrock with some trees and shrubs but contained little topsoil. The area was cleared and backfilled with mine spoils, eliminating the basin. Backfilling of the north basin area provided addition fill area allowing the removal of spoils from other drainage pathways.

Mine Spoils Pile

Exceeding reclamation plan requirements, all slopes were recontoured to a minimum of 4H:1V to curb erosion and enhance vegetation. Backfilling the north drainage area allowed enough fill area to minimize the steepness of the slopes. Backfilling of the north drainage also allowed the spoils pile to be blended into the existing slope and surrounding area.

Stockpiles and Topsoiling

Umetco salvaged topsoil during site reclamation using techniques that can be utilized at other reclamation projects where similar conditions exist. Initially, the ore pad was excavated and placed on Stockpile B, and that stockpile was consolidated. Concurrently, the mine spoils pile was being contoured. After completing mine spoils contouring, topsoil was borrowed from beneath the ore pad area and used to cover the mine spoils pile (Figure 7). The borrow area was then backfilled with material from Stockpiles A and B. In addition, trenches were dug around the toes of all piles to collect topsoil (Figure 8). The spoils pile slopes were backfilled into the trenches, and the topsoil was used to cover the piles. Backfilling the stockpiles into the borrow area and toe trenches effectively removed their visual presence.

Seedbed Preparation

All disturbed areas were disked and seeded with standard farming equipment then imprinted with a machine that creates small holes approximately 8 inches square and 6 inches deep. The machine (Figure 9) was designed and constructed by Umetco. It is attached to a dozer and rolled across the seeded area. The small holes catch and concentrate stormwater protecting slopes from erosion and promoting vegetative growth.

PRESENT SITE CONDITIONS

Reclamation of the site also included the closure of mine ventilation raises and the portal, the removal of power lines, the mine plant and mine related debris, and the reclamation of two evaporation ponds.

Backfilling the trenches and borrow area with mine spoils effectively made Stockpiles A and B disappear. All disturbed areas were covered with at least 6 inches of topsoil, and all topsoil was borrowed from previously disturbed areas (Figures 7 and 8). The site was seeded in the fall of 2000 and should be ready for post-mine land use in two years. Thus the Calliham Mine site (having no salvaged topsoil) was successfully reclaimed leaving no sign of previous mining activity.